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LETTERS TO THE EDITOR

## BCGitis in children

## BCGite nas crianças

*Dear Editor:*

The bacille Calmette-Guérin (BCG) vaccine is a live-virus vaccine with attenuated strains of Micobacterium bovis,[1,2] currently reaching >80% of infants in countries such as Portugal[2] (97% coverage in 2011[2]) where it is part of the childhood immunization programme.[1] Adverse effects are rare and mostly include local reactions – lymphadenitis is the most common event,[1,3,4] characterized by ipsilateral regional lymph nodes enlargement (nonsuppurative or suppurative), 2–8 months after vaccination. There is no consensus about the best treatment for lymphadenitis.

From 2010 to 2012, 4209 children were born in Vila Nova Gaia, of which 4059 received BCG vaccine and 4 cases of BCGitis occurred in our center – 3 were boys and none had immunity disorders or known family diseases. In all of them, nodal involvement was ipsilateral to BCG administration, without associated symptoms or physical examination abnormalities and happened less than 1 year after vaccination (1–10 months). One child had persistent non-suppurative lymphadenitis and three developed suppurative disease (1–3 months after node enlargement) – Fig. 1. Two children had lymph-nodes surgical exeresis – one with persistent axillary lymph-node (aspirative biopsy positive for Micobacterium bovis) and other with suppurative lymphadenitis (exeresis during suppuration phase). Two others (suppurative lymph-nodes) had spontaneous drainage (positive for Micobacterium bovis) with complete fistulae resolution for 2–9 months (without being submitted to surgery, needle aspiration or antibiotics).

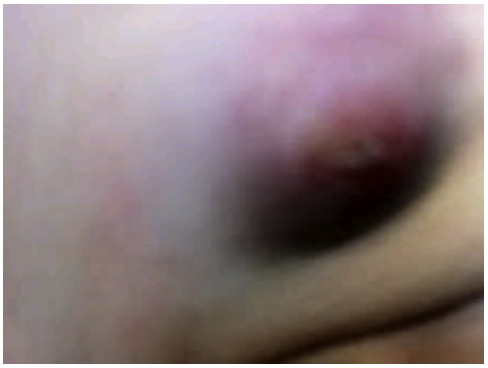

**Figure 1** Left axillary lymphadenitis.

Our rate of lymphadenitis is lower than those presented in previous studies[3] – early vaccination is associated with a lower risk[3] and the lower the dose administered, the lower the risk of adverse events[3] – we had 0.05 mL administered at birth.[2] The nurses' experience does not seem to affect the outcome[3] but it could not be evaluated in our context.

The nonsuppurative form usually has a benign clinical course. The suppurative form is characterized by a suppurative material collection that can rupture with persistent caseous discharge and wound healing taking several months – secondary bacterial infection, scarring or keloid formation are common. Our incidence of suppurative lymphadenitis is similar to worldwide data – 30–80%.[1] The risk of suppuration is higher in younger ages and in those who rapidly develop BCGitis[5] – our suppurative cases developed lymphadenitis less than 4 months after being vaccinated.

There is no consensus about the management of BCGitis but treatment is not usually necessary for local reactions[4] and no clear benefit of active treatment (pharmacologic treatment, needle aspiration or surgical excision) over expectant attitude[4] was found, although some studies advise aspiration or surgery to reduce healing time and adverse cosmetic effects.[4,5] Although two of our children had spontaneous drainage without medical or surgical treatment, none had sequelae.

Management of these cases should consider the risk of invasive procedures versus the length of time for resolution and the cosmetic effects of conservative measures.

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## Lung volumes in the pathogenesis of obstructive sleep apnea

## Volumes pulmonares na patogénese de apneia obstrutiva do sono

*To the Editor:*

Obstructive sleep apnea (OSA) is a complex disorder characterized by recurrent episodes of upper airway obstruction. Obstructive events occur at the level of the pharynx and there are many factors which contribute to its collapsibility. It has been suggested that reduced end-expiratory lung volumes may play a role.[1] However it is not clear whether, and to what extent, lung volumes influence obstructive events and oxygen desaturations independently of other factors.

To find answers to this, all patients evaluated in a sleep consultation unit, over a 6-month period, with complaints of snoring and excessive sleepiness, were examined with home or laboratory polysomnography and performed static and dynamic spirometry. Apnea-hypopnea index (AHI), oxygen desaturation index (ODI) and minimal oxygen desaturation (mO2) were evaluated in relation to patient lung volumes.

A total of 75 subjects (47 males, aged 54.4 ± 12.3, BMI 30.9 ± 4.7 kg/m$^2$) were evaluated, 50 had OSA, 8 severe (AHI > 30/h) and 14 moderate (AHI > 15/h). None had a history of lung disease. Age, weight, BMI and neck circumference were significantly higher in the OSA group. There was no significant difference in the lung volumes between the two groups. However, in the moderate/severe OSA patients,AHI correlated with expiratory reserve volume (ERV), airway resistance (Raw) and BMI; mO2 correlated with functional residual capacity (FRC) and BMI (Table 1). In regression analysis, BMI, FRC and ERV were found to be associated with AHI and/or mO2, but only ERV was found to be independently related to AHI.

We found that repeated ahead ERV, FRC and BMI were associated with the occurrence of obstructive events. This

**Table 1** Correlation and regression analysis of OSA variables with patients' characteristics and lung volumes.

| Patients' parameters | AHI | | | | mO2 | | | |
|---|---|---|---|---|---|---|---|---|
| | Spearmann's correlation | | Regression analysis | | Spearmann's correlation | | Regression analysis | |
| | *R* | *p*-Value | Univariate | Multivariate | *R* | *p*-Value | Univariate | Multivariate |
| Age (years) | 0.129 | (ns) | – | – | 0.018 | (ns) | – | – |
| BMI (kg/m$^2$) | 0.571 | 0.006 | 0.042 | (ns) | −0.499 | 0.03 | 0.012 | (ns) |
| Neck circumference (cm) | 0.04 | (ns) | – | – | −0.346 | (ns) | – | – |
| Abdominal cir. (cm) | 0.255 | (ns) | – | – | −0.209 | (ns) | – | – |
| Epworth's score | 0.163 | (ns) | – | – | −0.177 | (ns) | – | – |
| FEV1 (l) | −0.287 | (ns) | – | – | −0.169 | (ns) | – | – |
| FVC (l) | −0.407 | (ns) | – | – | 0.029 | (ns) | – | – |
| TLC (l) | −0.426 | (ns) | – | – | 0.203 | (ns) | – | – |
| RV (l) | −0.102 | (ns) | – | – | 0.279 | (ns) | – | – |
| FRC (l) | −0.388 | (ns) | – | – | 0.531 | 0.019 | 0.033 | (ns) |
| ERV (l) | −0.577 | 0.005 | 0.007 | 0.0015 | 0.262 | (ns) | – | – |
| Raw | 0.516 | 0.014 | – | – | −0.026 | (ns) | – | – |

BMI: body mass index; FEV1: forced expiratory volume in the 1st second; FVC: forced vital capacity; TLC: total lung capacity; RV: residual volume; FRC: forced residual capacity; ERV: expiratory reserve volume; Raw: airway resistance.